

Phantom Orchid (*Cephalanthera austiniiae*)

Global: G4 Provincial: S2 COSEWIC: T (May 2000) BC List: Red



South Coast Occurrence Range



Distinguishing feature: The phantom orchid is a ghostly white, non-photosynthetic perennial with multiple flowers on each stem. Each flower bears a distinctive yellow gland on the lower lip-shaped petal.

Distribution: Endemic to the Pacific Northwest, the Phantom Orchid occurs in California, Oregon, Washington, Idaho and British Columbia at low to middle elevations. In Canada this species is restricted to only three locales in British Columbia: the Lower Fraser Valley, Gulf Islands (Saltspring Island) and the Saanich Peninsula of southeastern Vancouver Island. Less than 100 flowering stems have been reported but the number of flowering stems varies from year to year. Because the majority of the orchid plant is below ground, with only the flowering stems appearing above ground, it is nearly impossible to accurately count individuals. Flowering stems are merely indicators of presence and potential viability, not actual population numbers. Although suitable habitat appears to exist in parts of the Fraser Valley, this species is rare and localized.

Description: The phantom orchid is a white, non-photosynthetic, rhizomatous perennial, up to 65 cm in height. Flowering stems have 5-20 scented white flowers, each with a yellow patch on the lower lip. 2-5 bract-like leaves are present along the stem. The stems turn yellowish or brownish as they age. After flowering, dry, seed-bearing capsules may form.

Look's Like?

Indian pipe (*Monotropa uniflora*) is a similar looking, white, non-photosynthetic perennial that occurs in the same types of habitats as phantom orchid. The two species can easily be distinguished because phantom orchid has numerous upright flowers on each stem and the flowers bear a yellow gland on the lower petal. In comparison, Indian pipe bears only a single drooping, bell-shaped flower on each stem and the flowers are pure white. Also, phantom orchid flowers are fragrant while those of Indian pipe are not.

Habitat: Phantom orchid occurs in moist to mesic, shaded forests. It is usually found in association with mature and old-growth coniferous or mixed forests but is also found in deciduous forests dominated by bigleaf maple. Phantom orchid can occur in association with Douglas fir, western red cedar, bigleaf maple and paper birch. Plants are often found in sites with a sparse understory where there is little competition and a lack of large woody debris. You will most likely find the phantom orchid on south and west facing slopes, although it occurs in other aspects. It appears to prefer limestone/calcareous soils and has been found on old shell middens, limestone tailings and compost piles rich in lime.

Critical Features

- ❑ The Phantom Orchid is a “**mycopheterotrophic**” species. This means that it lacks chlorophyll and rather than photosynthesizing, it obtains its nutrients from decaying humus through a three-way partnership with fungi in the Thelophoraceae Family, and a tree or shrub species (Taylor et al. 2002). The orchid forms an association with the fungus, which in turn forms an association with the tree species. While little is known about which tree or shrub species play a role in this relationship, the phantom orchid has been observed growing in close proximity to bigleaf maple and is often found at the base of mature birch trees. This complex relationship means that the health of the fungus and the partner tree is integral to the health and viability of phantom orchid populations. Therefore, disturbance that impacts either the partner tree or the fungal partner may affect the orchid. The fungal partner is a forest-dependent shade loving species that is restricted to intact mature forests, which further limits growing conditions for the orchid.
- ❑ Plants can remain dormant underground for up to 17 years, without producing a single flowering stem above ground. So even if no flowering stems are visible, a plant may be present.
- ❑ Capsule and seed production is rare after flowering. This may be due to climatic constraints and/or a scarcity of suitable pollinators.
- ❑ The phantom orchid cannot be grown in cultivation so it is critical to protect existing sites.



Phantom orchid in mixed forest, Saanich Peninsula.



Habitat: phantom orchid growing over exposed shell midden, Gulf Islands (top) and growing through moss in the Fraser Valley (bottom).



Seasonal Life Cycle

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
				Flowering			Capsule production and seed dispersal (rare)				
Dormancy: plants may remain dormant for up to 17 years before flowering											

Threats

- This species occurs at the northern limits of its range in British Columbia which results in climatic constraints on populations in our region.
- Habitat modification and destruction resulting from urban development, timber harvesting and intense recreational activities, such as mountain biking, threaten the phantom orchid.
- Harvesting of plants by collectors and hobbyists who attempt to cultivate it can destroy fragile plants.
- There are large gaps in our knowledge about this species, including its complete distribution and population dynamics, growth, dormancy, flowering, pollination and dispersal requirements. We need to better understand the phantom orchid's association with calcareous substrates. Finally, we do not know which tree species are involved in the three-way partnership and how the orchid and its partner fungus spread below ground.

Conservation Objectives

- Protecting all known sites in our region will help maintain current populations and is required through Development Permit Areas and Wildlife Habitat Areas.

Management Practices Check List

- Promote habitat connectivity by retaining old growth and mature forest stands where possible.
- Retain a deciduous component where it occurs naturally in mixed forest sites.
- Within older forest habitats protect limestone deposits and outcrops which may also harbor other rare species.
- At each known site protect a core area and create a surrounding management zone. The core area is defined by the belowground perimeter of the orchid population, the adjacent partner trees and ideally the perimeter of the fungal partner.
- Maintain site microclimate within core areas by implementing a management zone large enough to buffer the orchid and its partners from edge effects.
- Maintain natural hydrological patterns within the core area.
- Minimize invasion by alien species by implementing a buffer zone and minimizing human access.
- Maintain potential host trees (all trees nearest to the flowering stems), intact tree canopy, and a natural deciduous component within the core area and management zone. Avoid harvesting or salvaging trees within the core area or management zone and do not remove canopy trees that provide critical shading. Avoid selective logging which can change the species composition of the forest.
- Protect populations from herbicide spray drift from adjacent logging operations. Do not use fertilizers, herbicides or pesticides near the orchid or its fungal partner.
- Avoid constructing roads, trails or stream crossings in the core area or buffer zone, especially uphill from populations.
- Prevent intensive recreational activities such as mountain biking.
- Avoid mowing during flowering period and prior to seed set where plants occur on private property on lawns.
- Prevent harvesting of the plant, including seeds or capsules.

Mitigating Impacts

- Distributing information to the public, like the B.C. Provincial Government's "Have you Seen the Phantom?" brochure, will encourage the public to report new populations and help reduce unnecessary harvesting.
- Anecdotal information indicates that allowing light grazing can be beneficial to this species by reducing competition and/or adding critical nutrients to the soil.

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Close-up of flowering stem by Dane Blakely Springmeyer, www.danespringmeyer.com.

Phantom orchid in mixed forest by Jamie Fenneman.

Habitat photographs by Rose Klinkenberg.